Myositis 101

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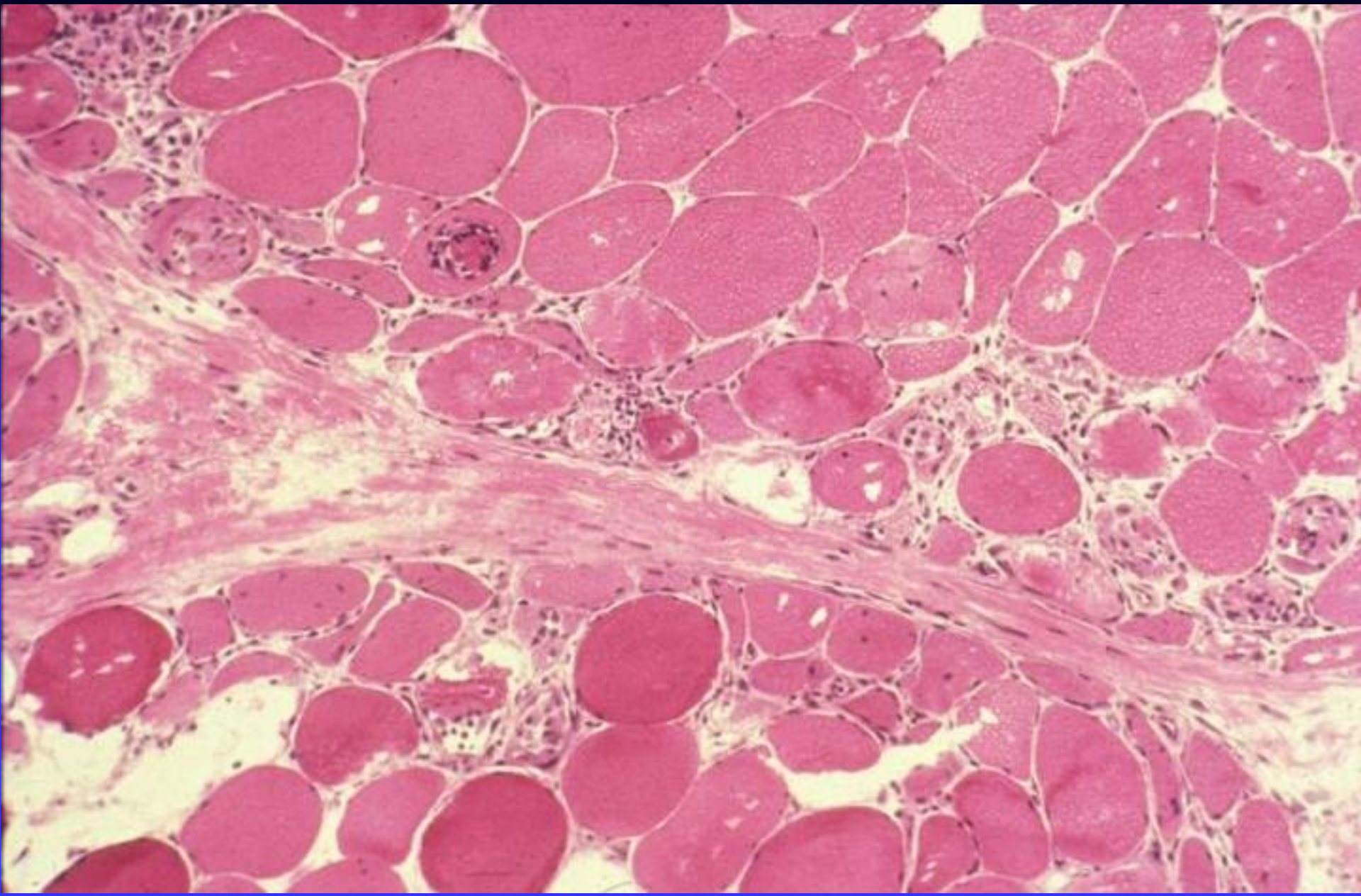
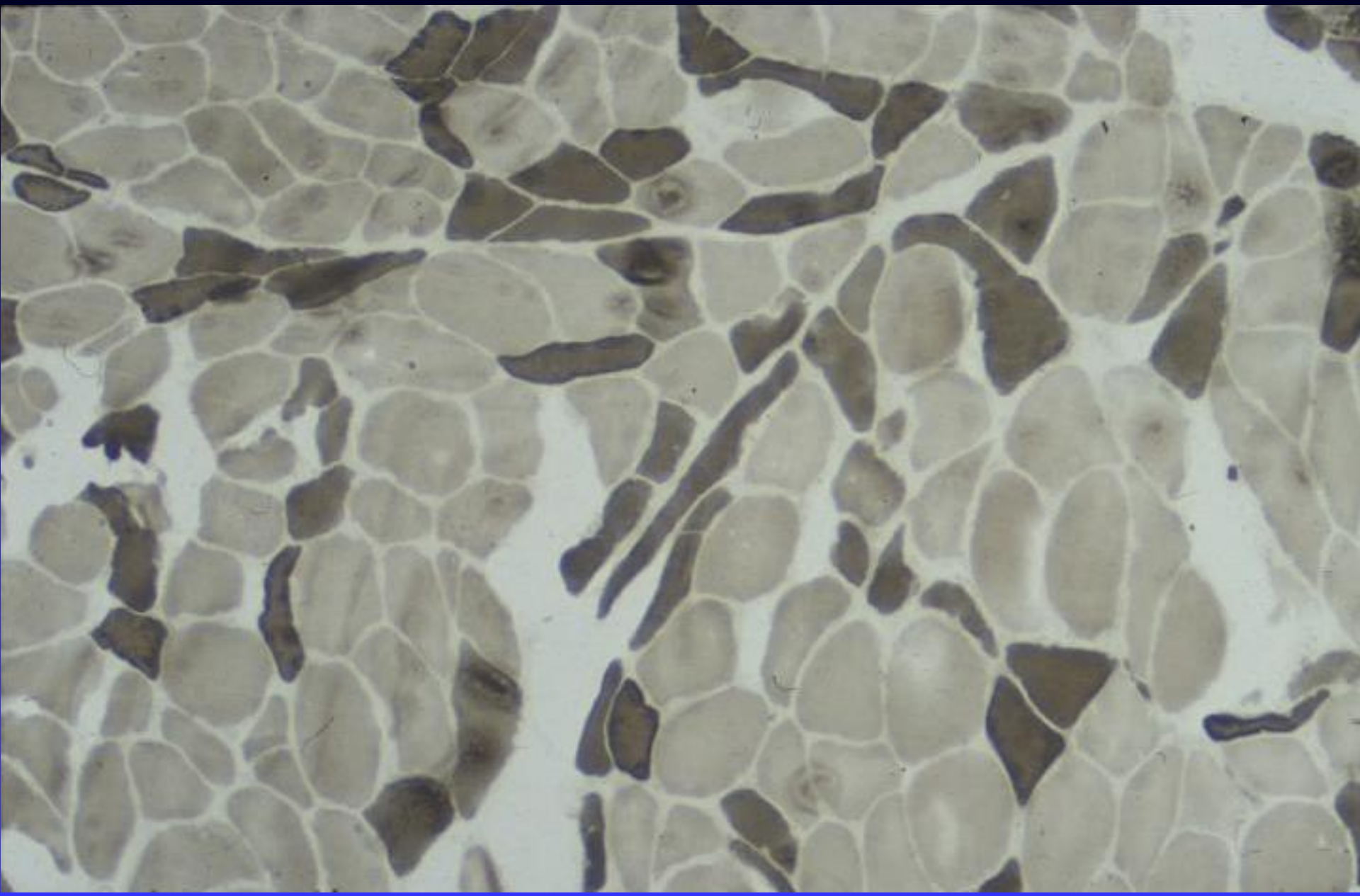
Criteria for Defining Polymyositis

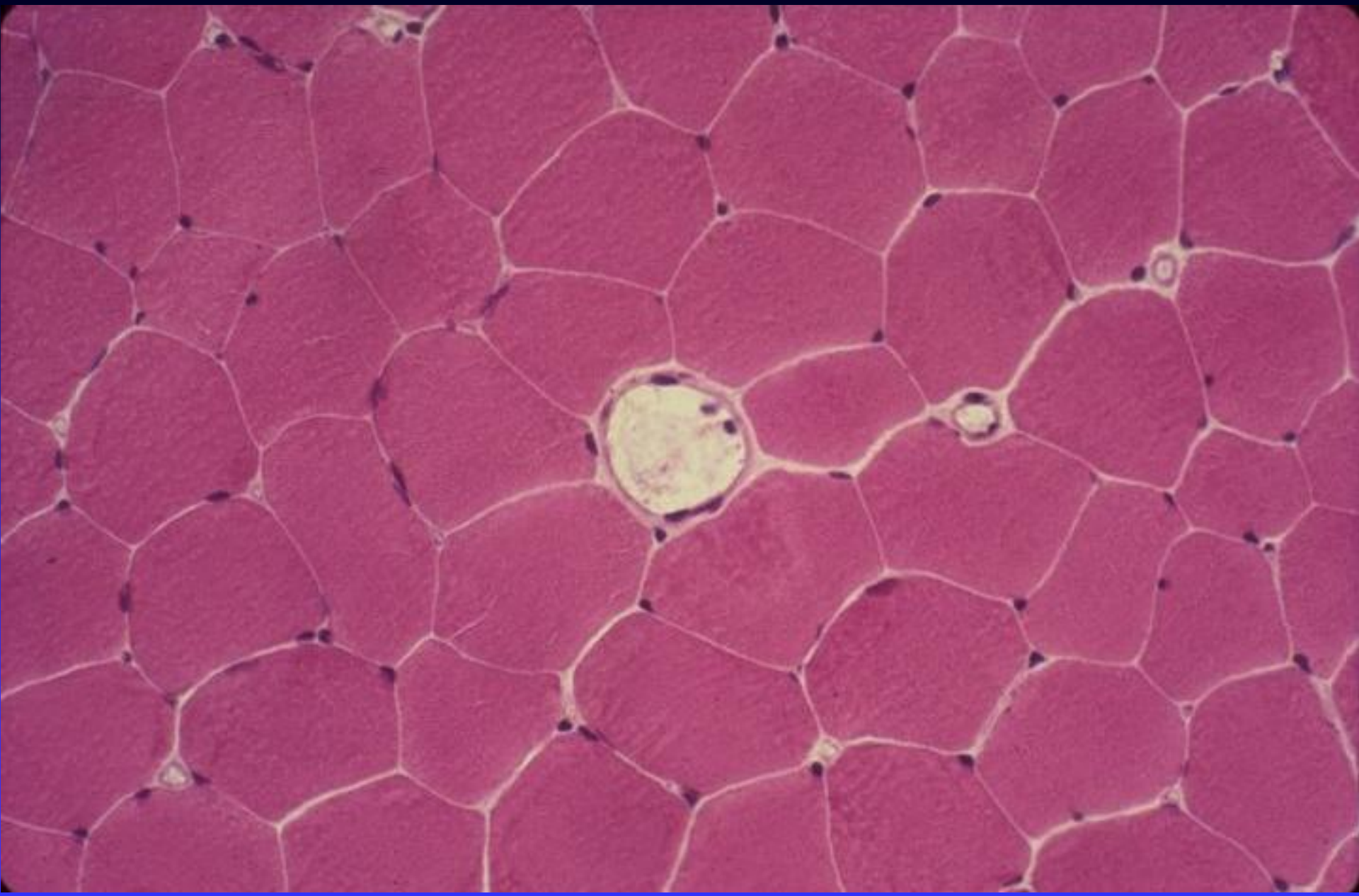
1. Symmetrical weakness of limb-girdle muscles and anterior neck flexors.
2. Muscle biopsy evidence of necrosis of Type I and II fibers, phagocytosis, regeneration, variation in fiber type with inflammatory exudation.
3. Elevation in serum or skeletal-muscle enzymes.
4. Electromyographic triad of short, small, polyphasia motor units, fibrillations and sharp waves; and bizarre, repetitive discharges.
5. Dermatologic features.

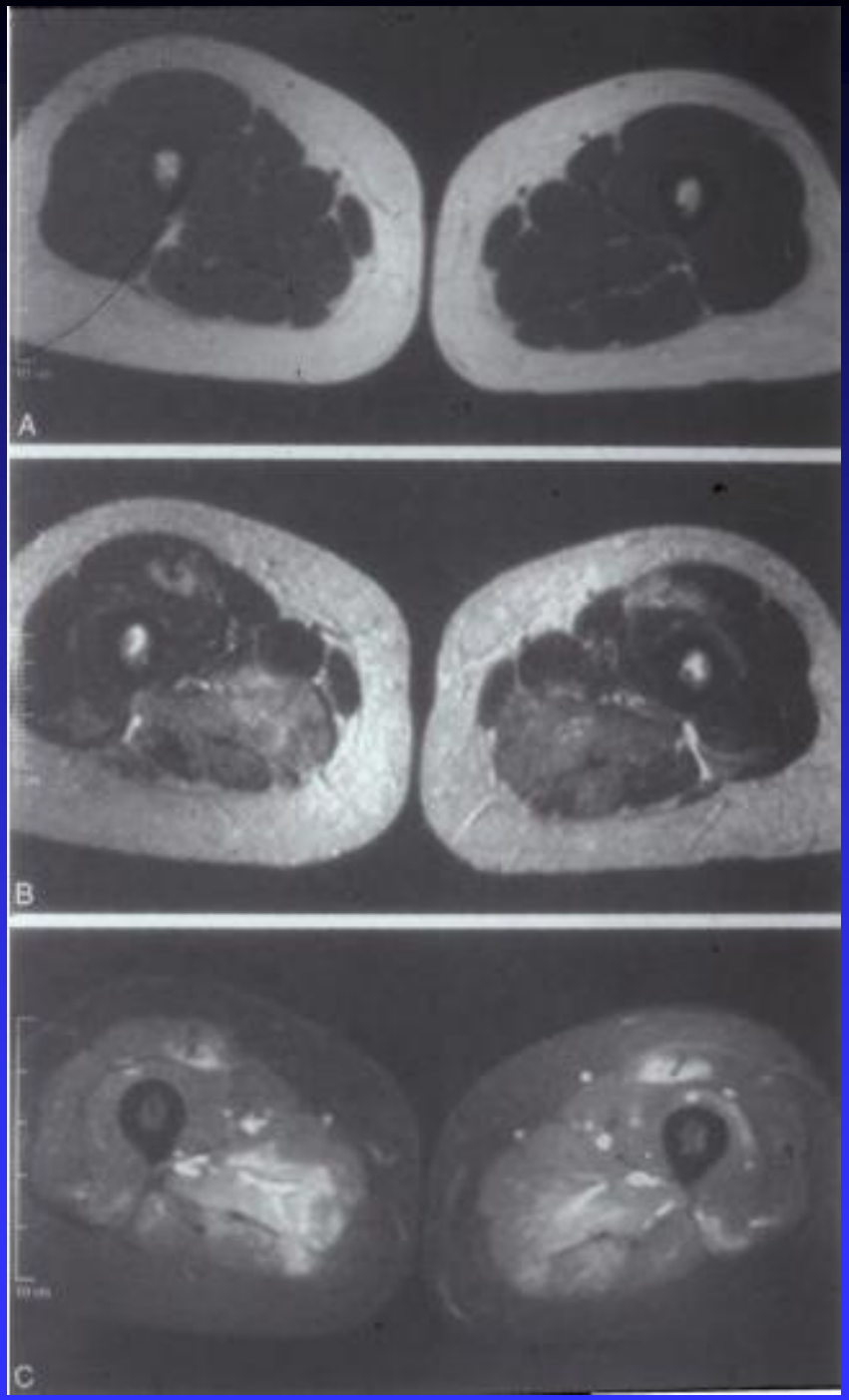
Bohan and Peter. *NEJM* 1975.

Nonsuppurative Inflammation of Muscle

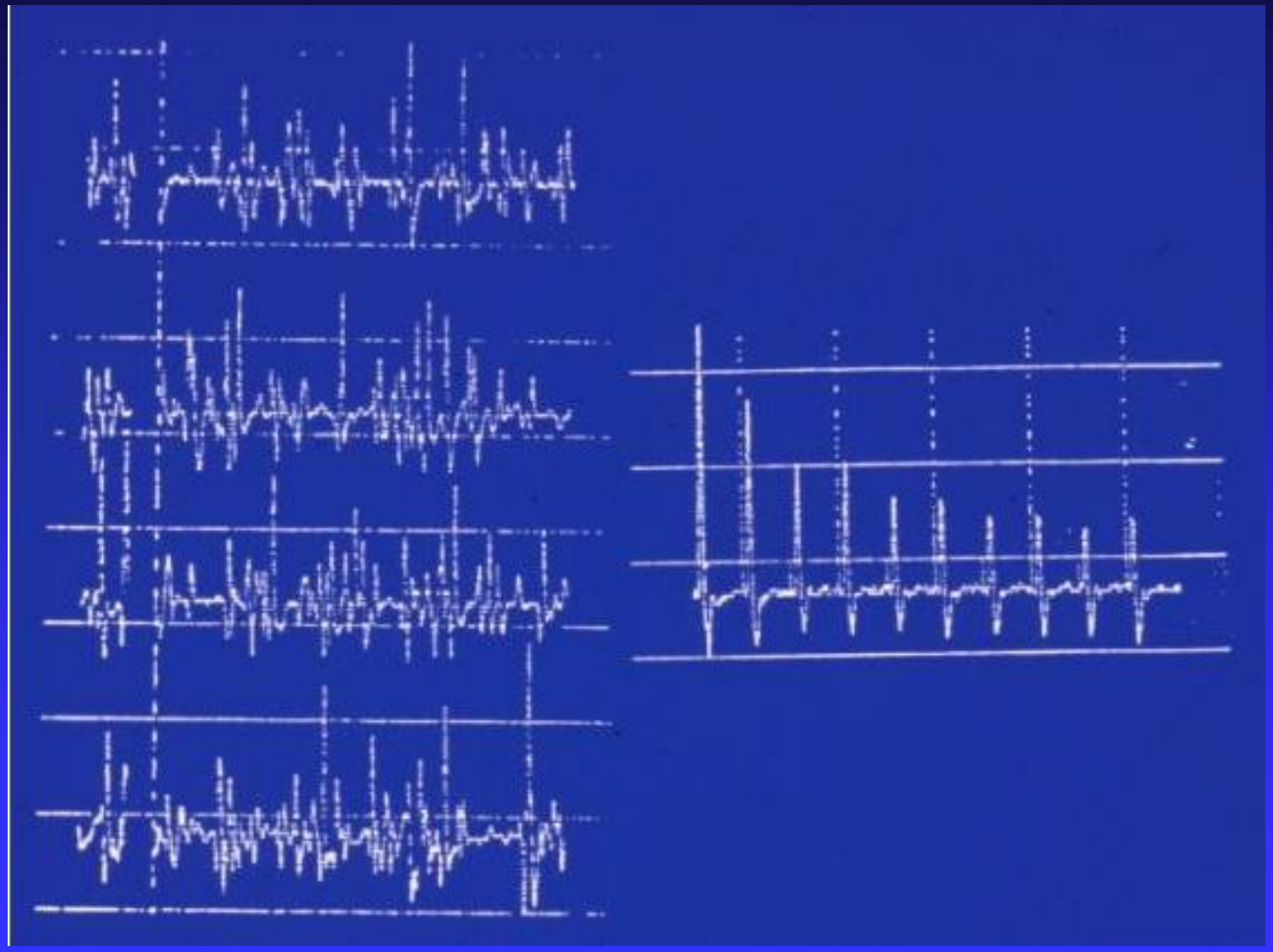







A
B
C

Electrodiagnostic Testing



Electrophysiologic Changes in Inflammatory Myopathy

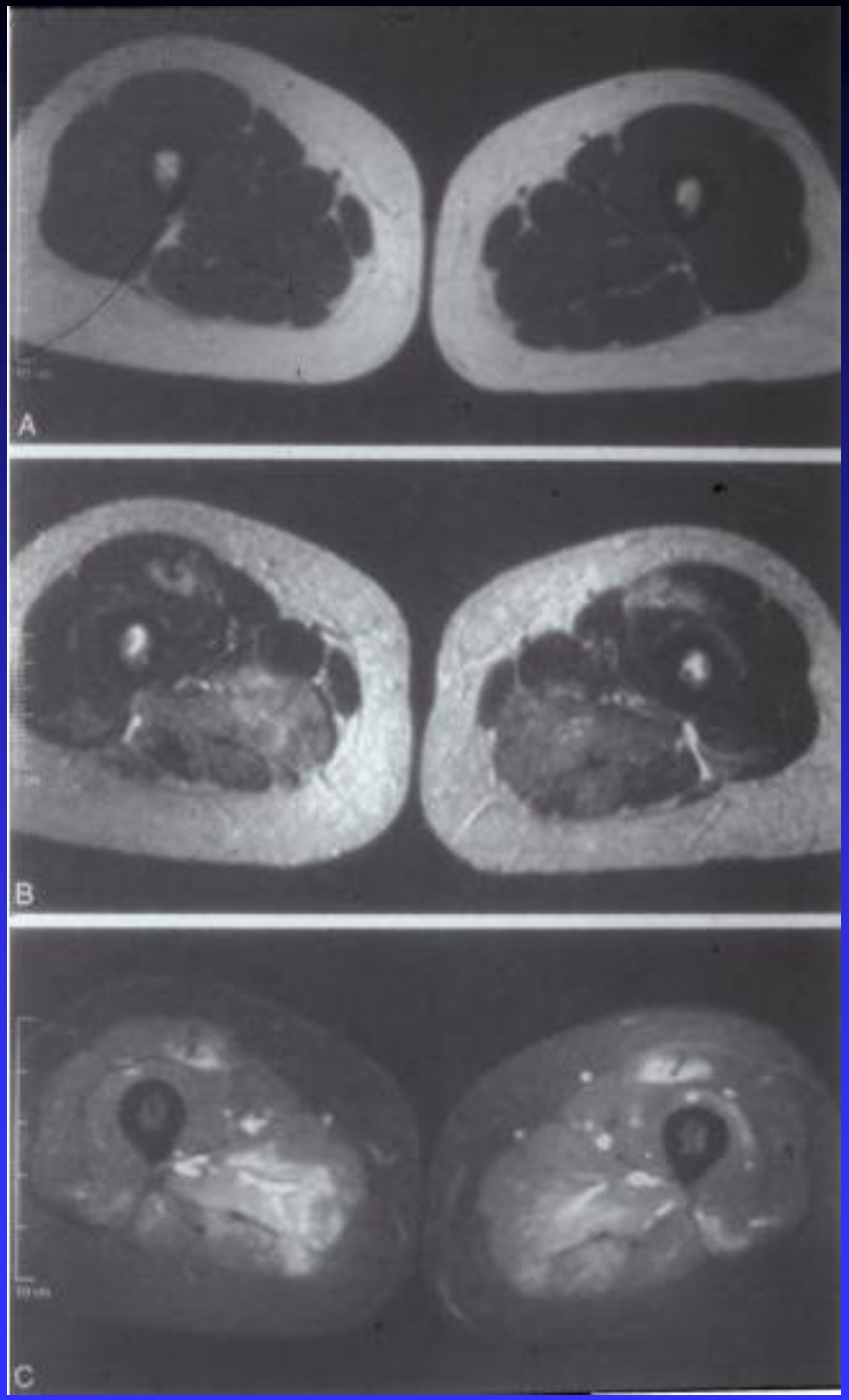
- Fibrillation at rest
- Increased insertional activity
- Bizarre high-frequency repetitive discharges
- Polyphasic potentials of short duration and low amplitude
- Spontaneous and positive sharp waves

EMG and Inflammatory Myopathies

- About 40% will have the classic triad
- EMGs are entirely normal in 10%
- Abnormalities may be limited to paraspinous muscles
- Neuropathic findings may also be seen in
  - Inclusion body myositis
  - Myositis with anti-SRP antibodies
  - Myositis and malignancy

EMG and Nerve Conduction

- Differentiate myopathic and neuropathic disorders and further localize the lesion.
- Identify appropriate site for biopsy.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Muscle Enzymes in IIM

- CPK, aldolase, AST, ALT, and LDH
- None of these enzymes may correlate well with disease activity
- Patients with an IIM may become completely asymptomatic, but continue to have elevated enzymes

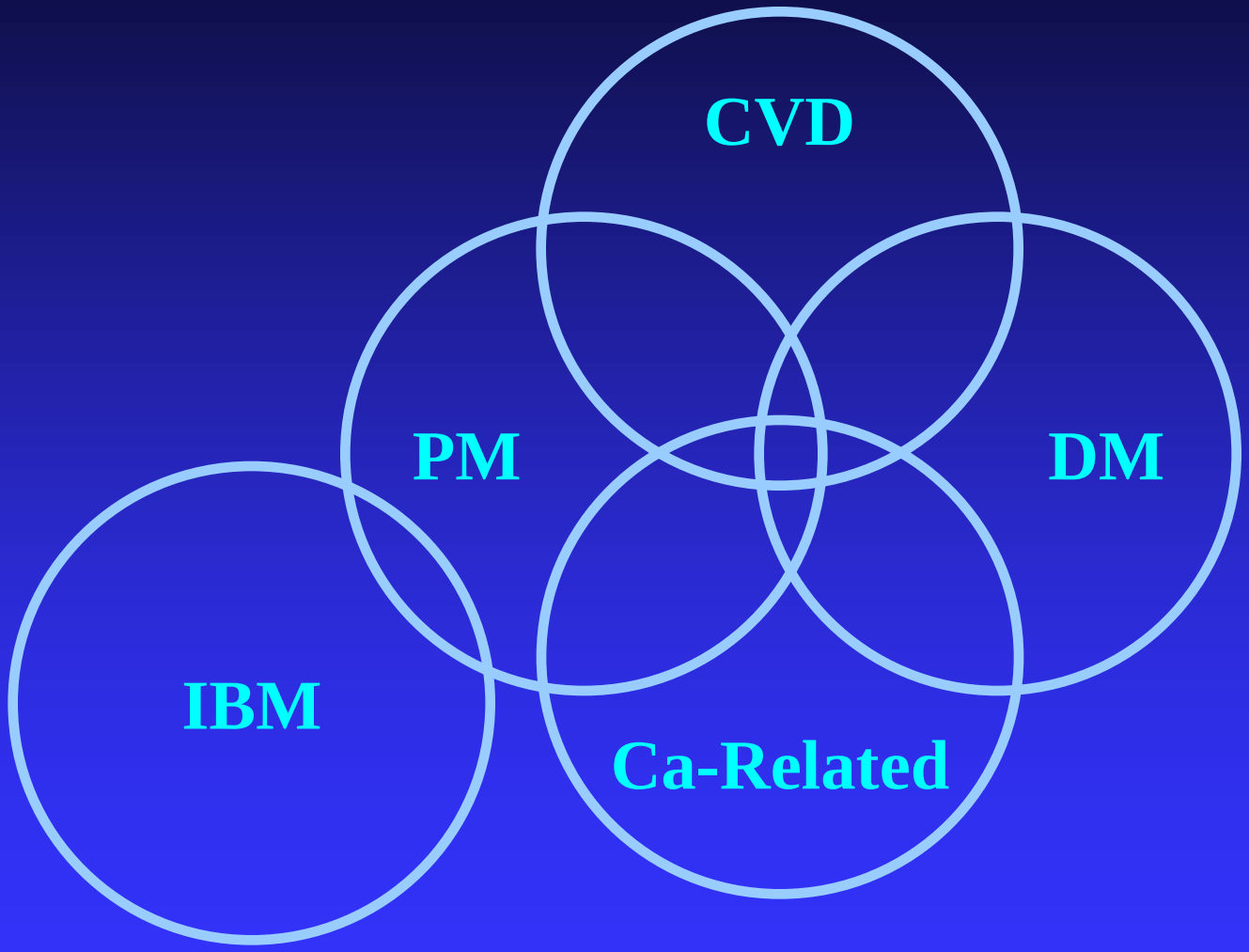
Not all High CK Levels are the due to Polymyositis! Other causes include:

- Racial differences
- Trauma
- Exercise
- Drugs/Toxins
- Carrier-states
- Pre-disease
- Benign (cause unknown)

Although the criteria are nonspecific, when occurring together, and without other explanations, the allow the diagnosis of an idiopathic inflammatory myopathy,

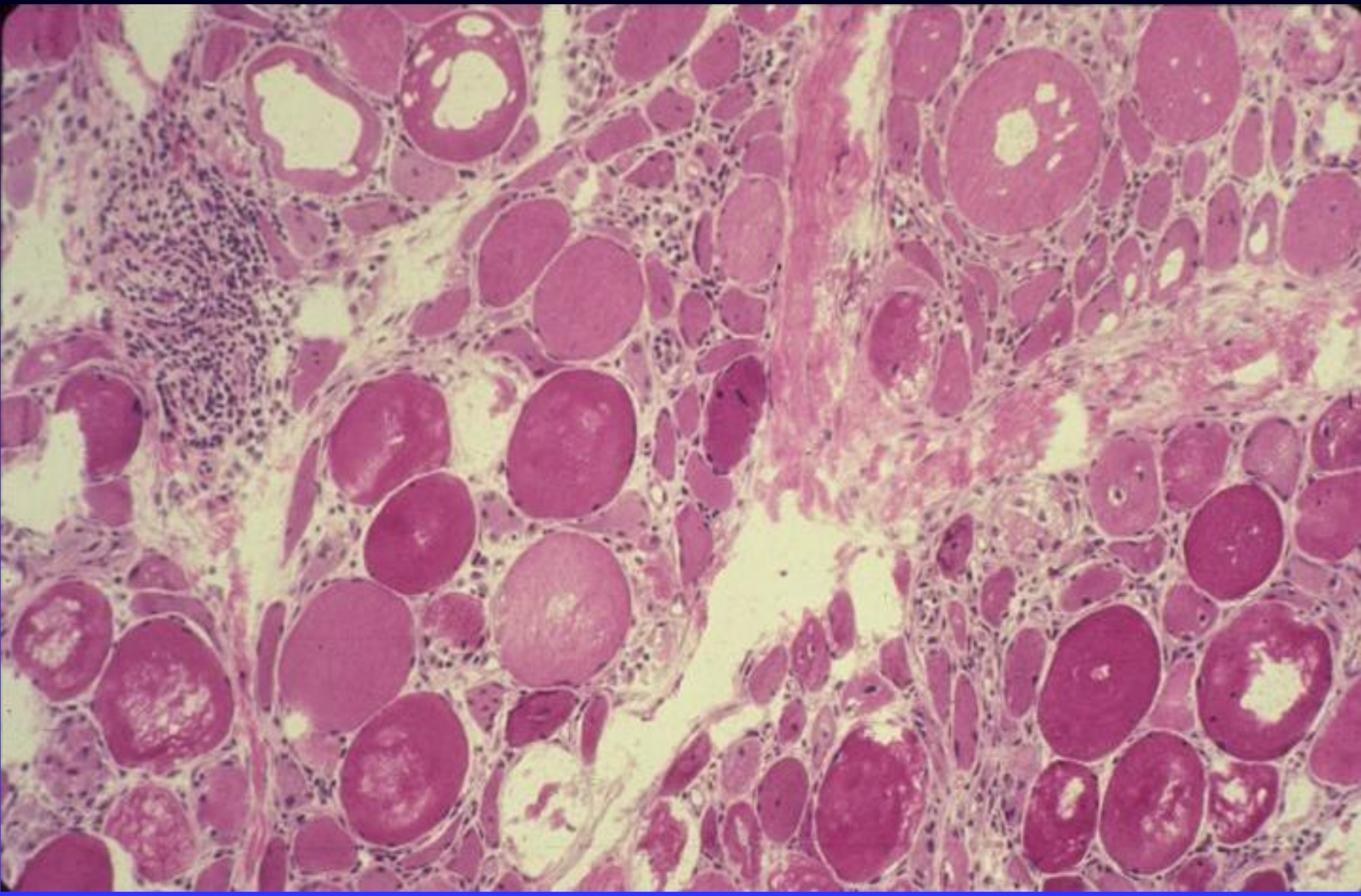
Idiopathic Inflammatory Myopathies

- Polymyositis
- Dermatomyositis
- Myositis with associated Collagen Vascular Disease
- Myositis with Malignancy
- Inclusion Body Myositis


CVD
PM
DM
IBM
Ca-Related

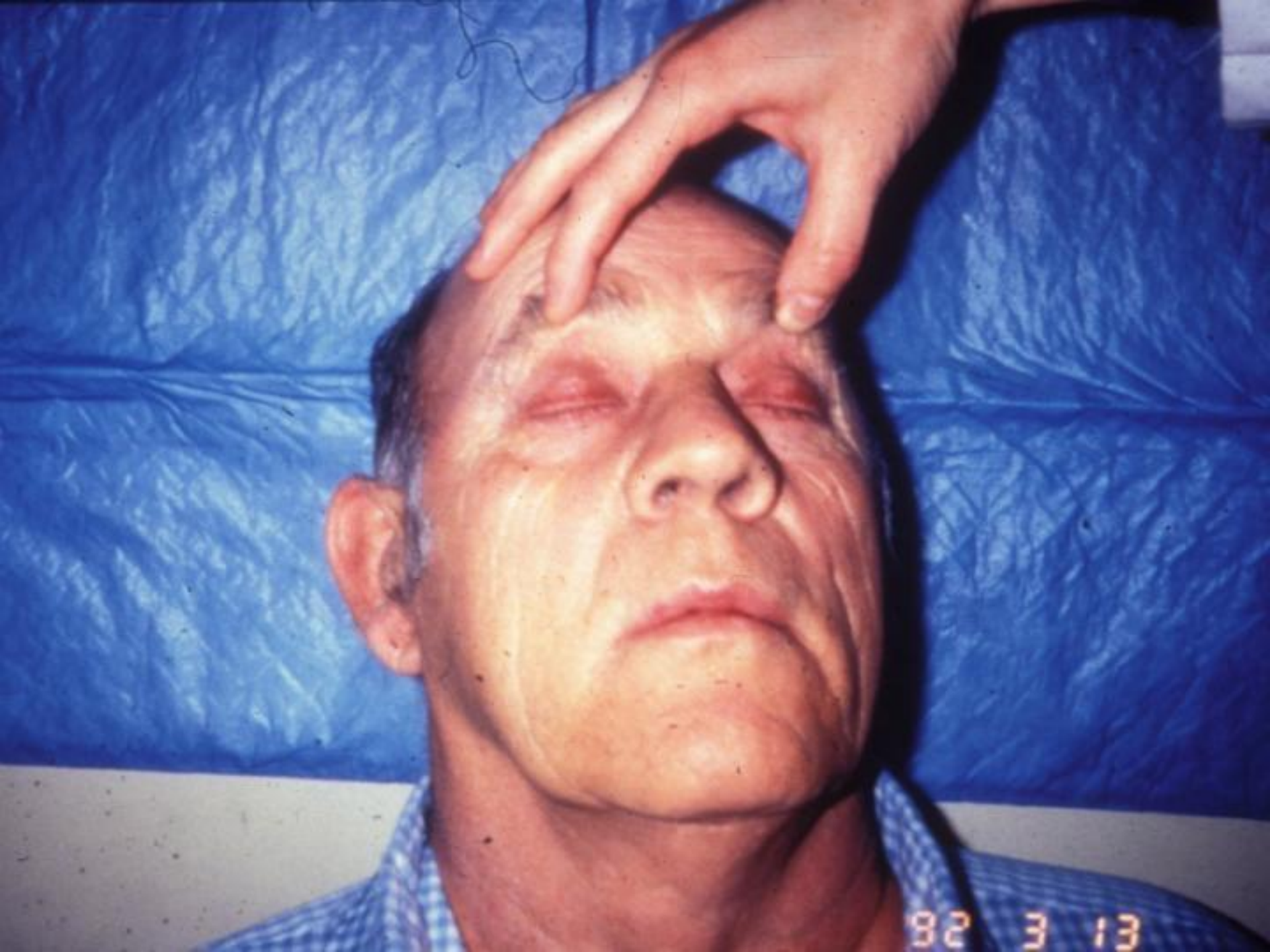
Polymyositis

- Proximal muscle weakness
- Elevated CPK
- Myopathic EMG
- Inflammation on histology



Dermatomyositis

- Polymyositis plus rash
- A different disease
- Different diseases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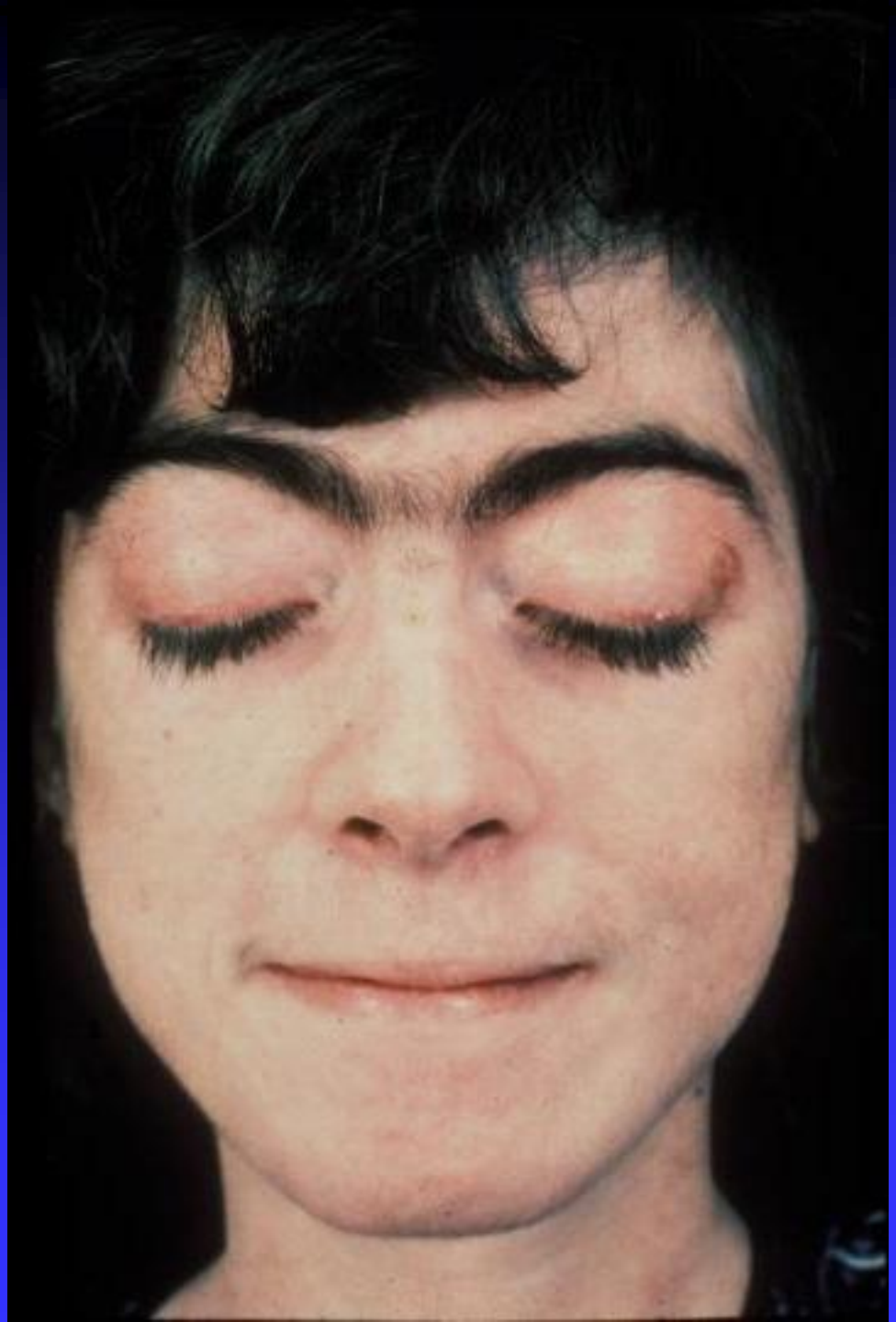
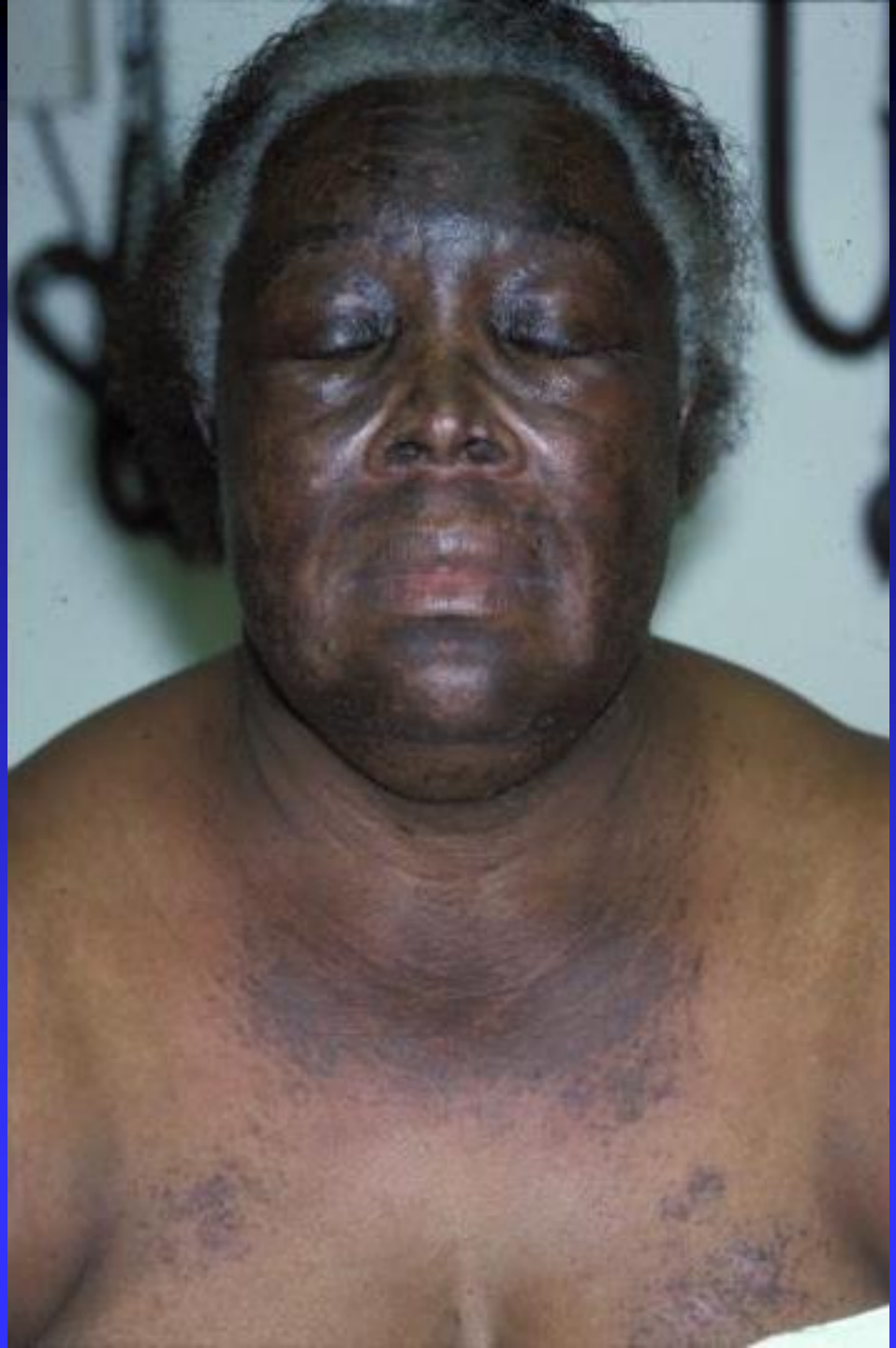
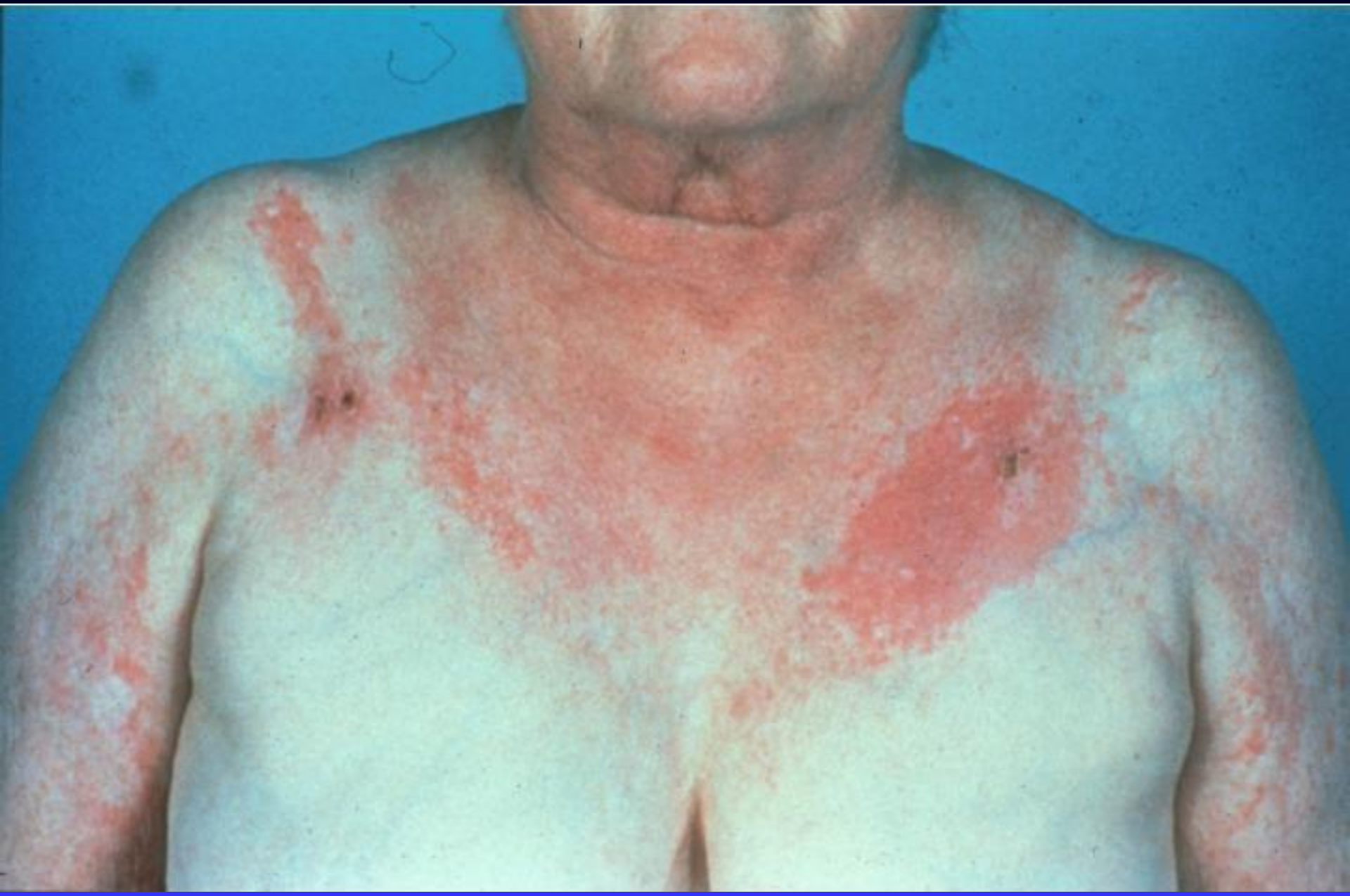
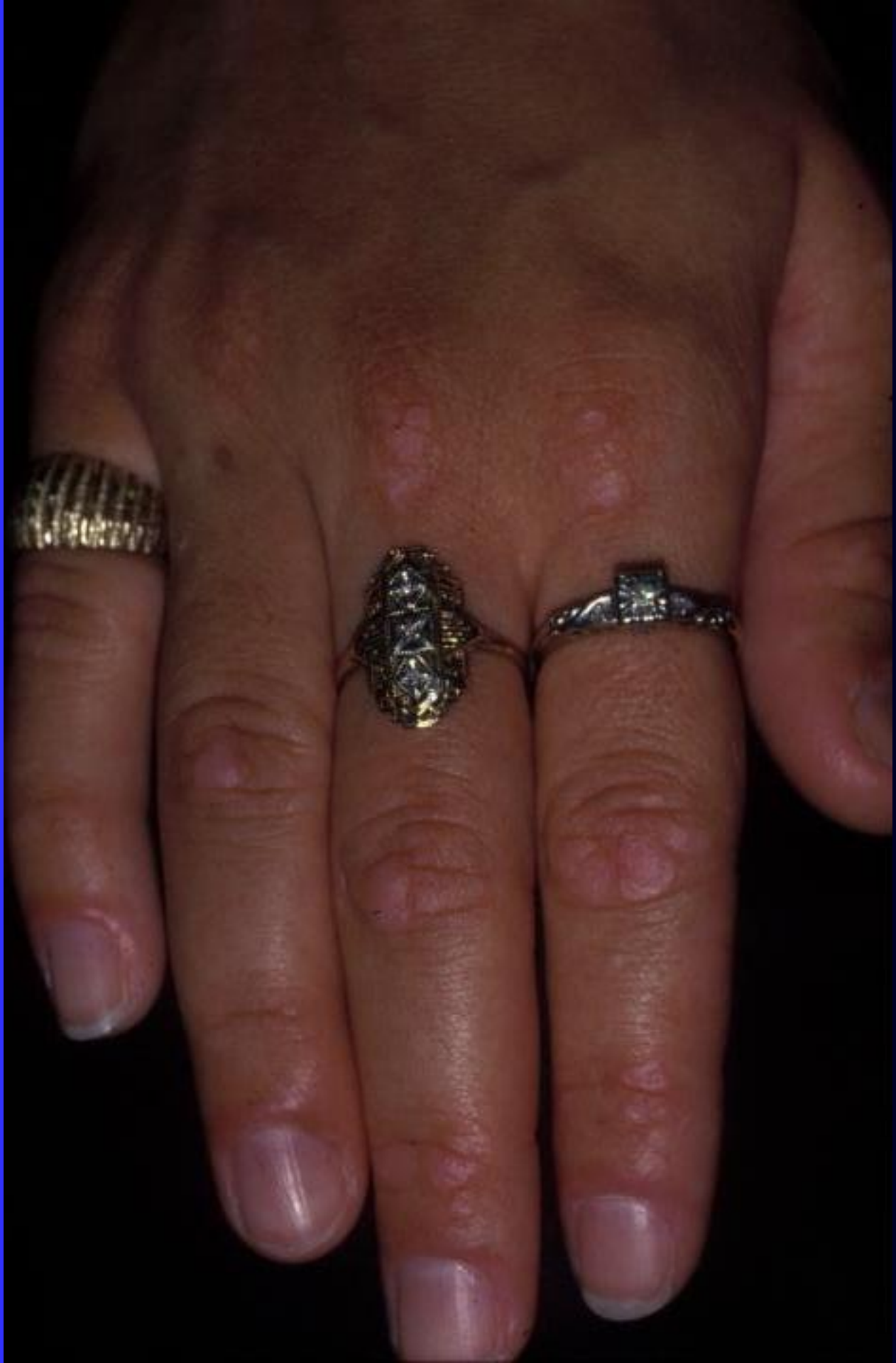
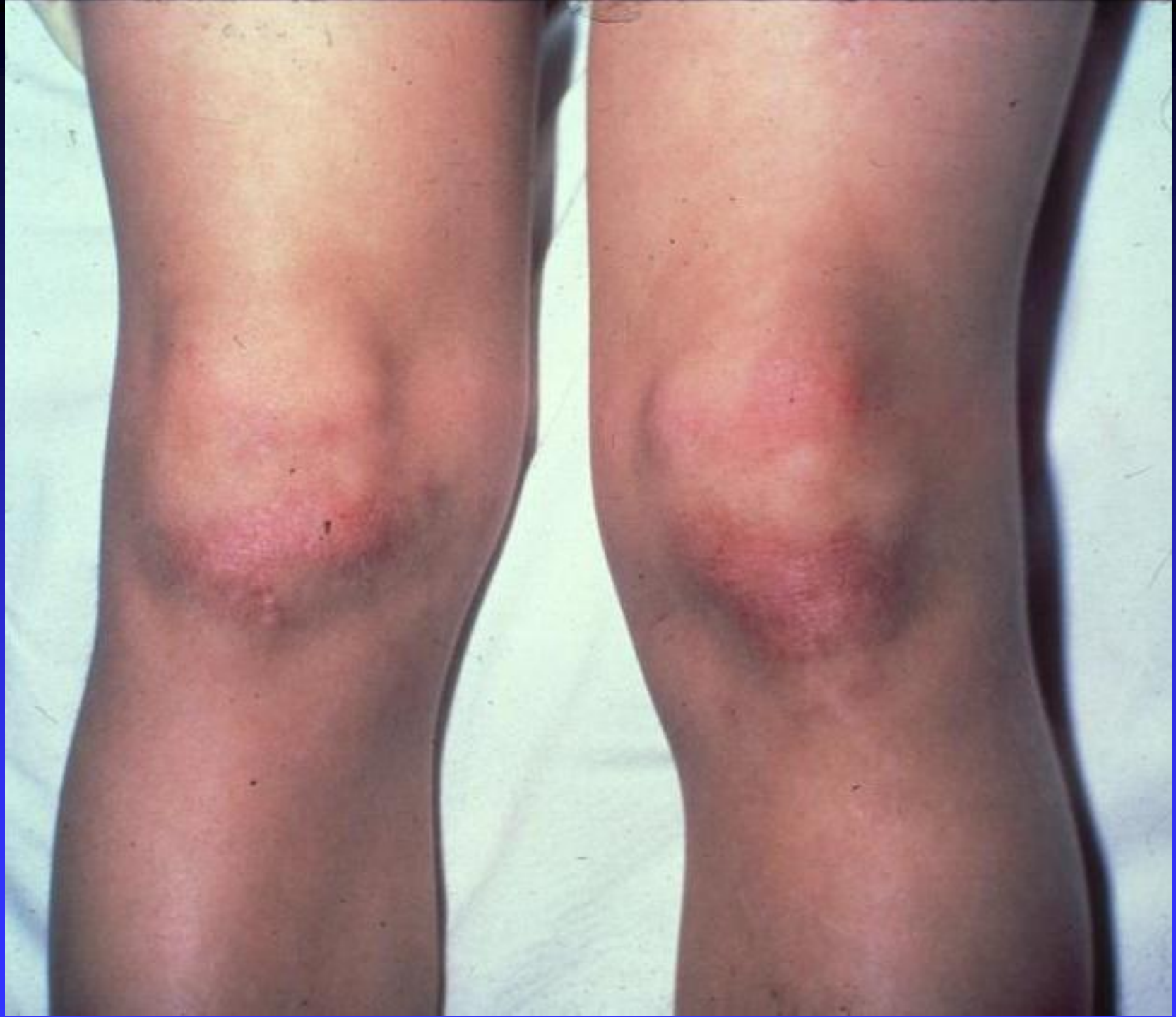
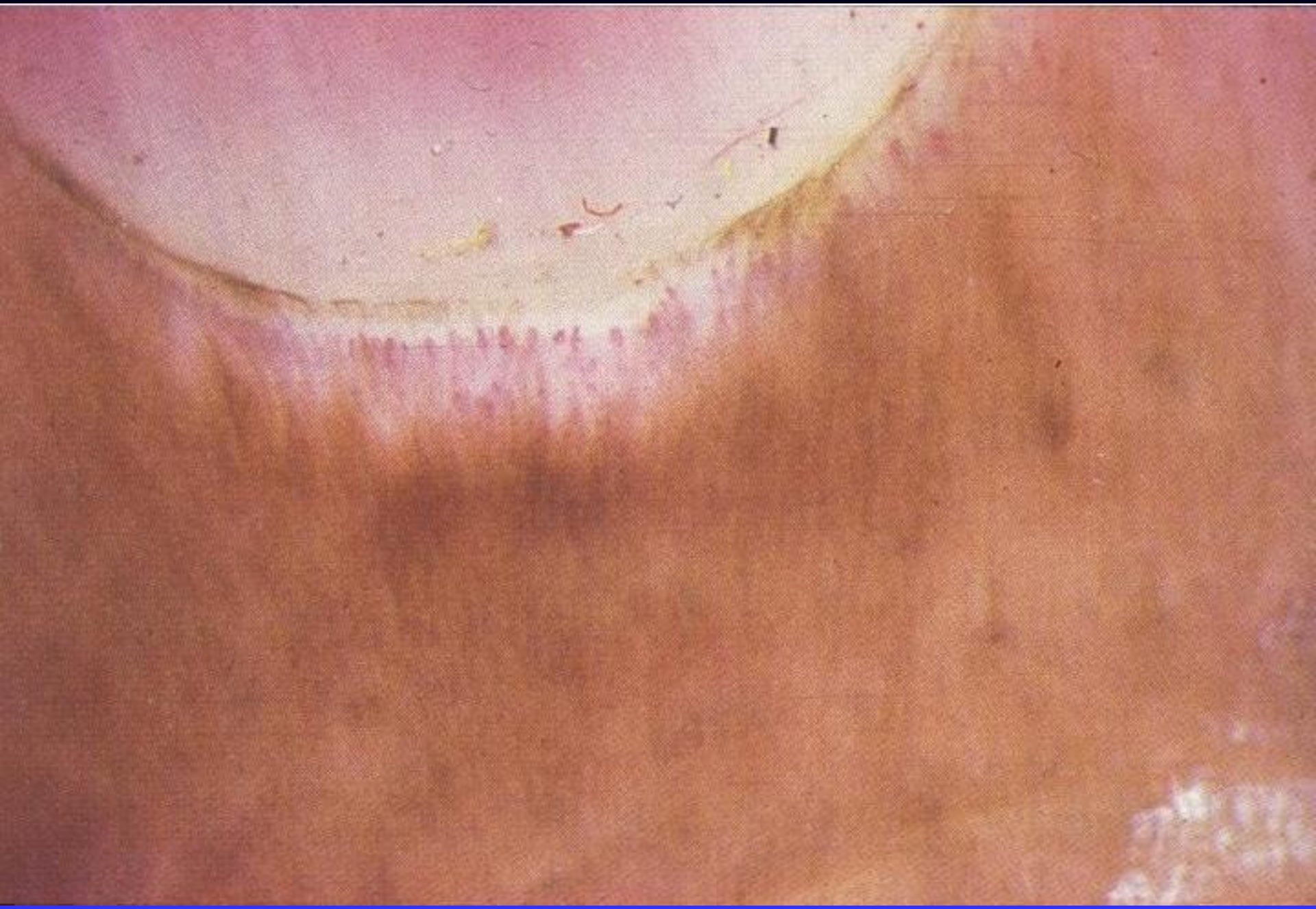


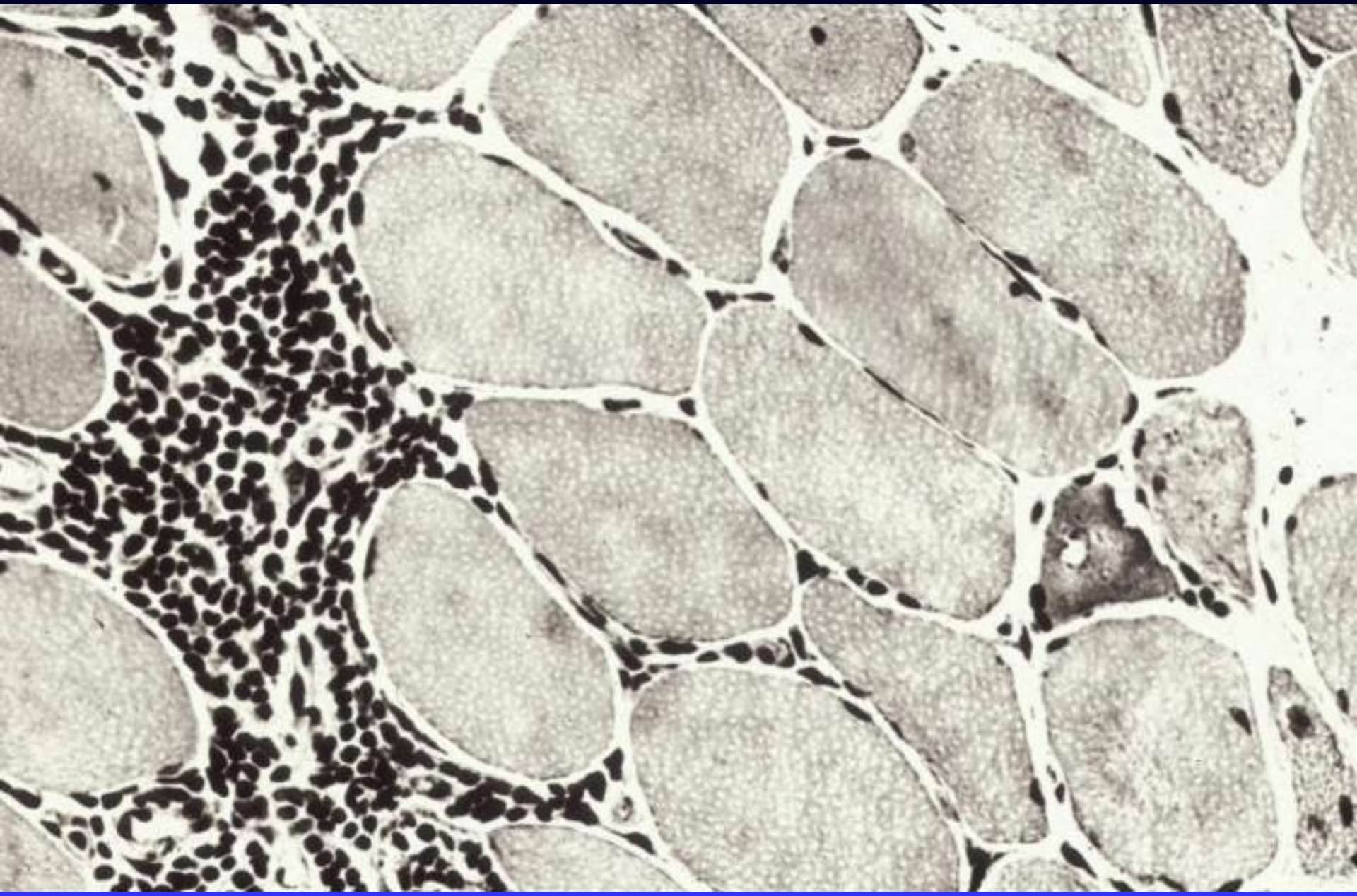


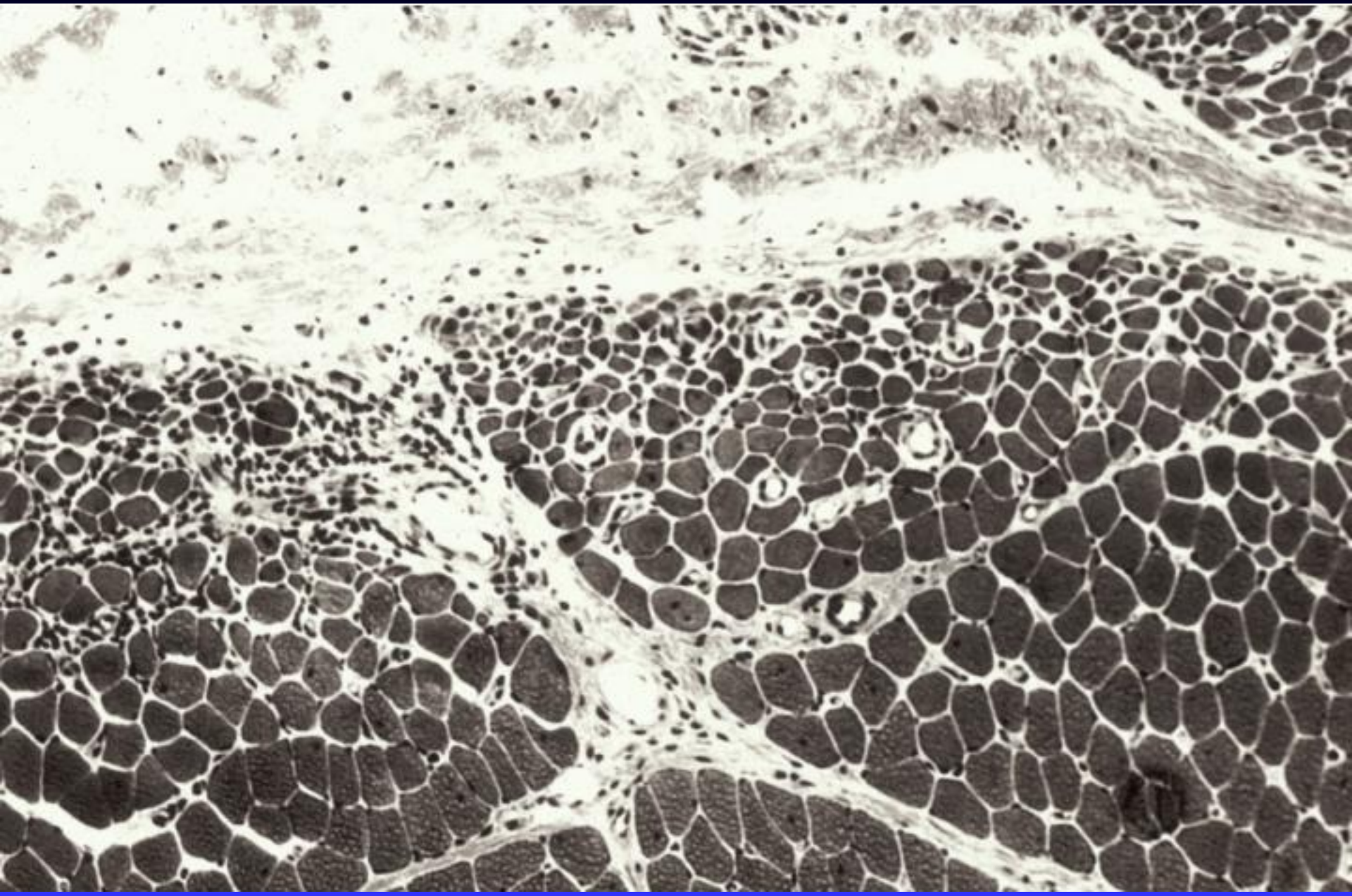






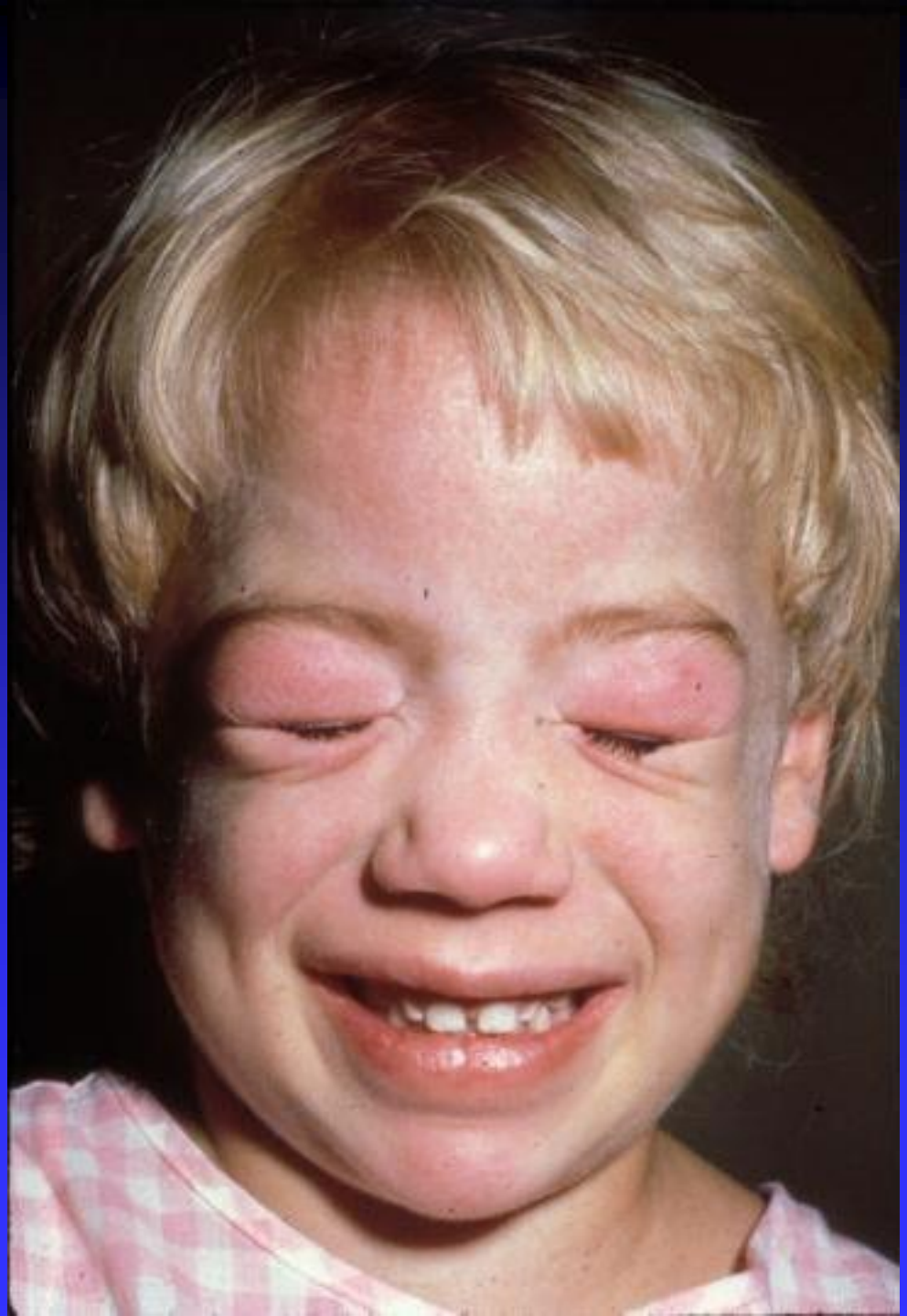


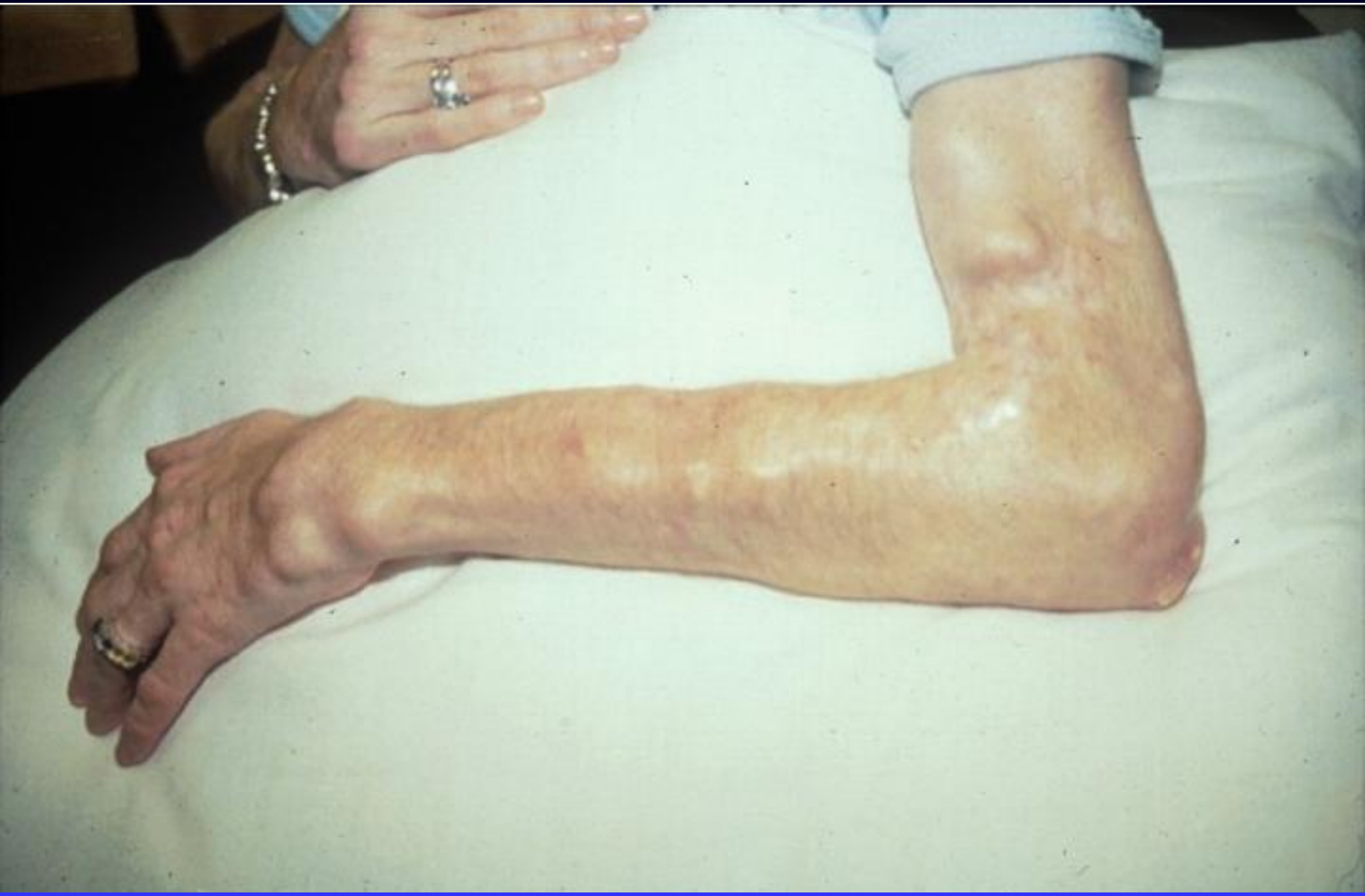




Dermatomyositis

- Subsets
  - Adult dermatomyositis
  - Juvenile dermatomyositis
  - Amyopathic dermatomyositis



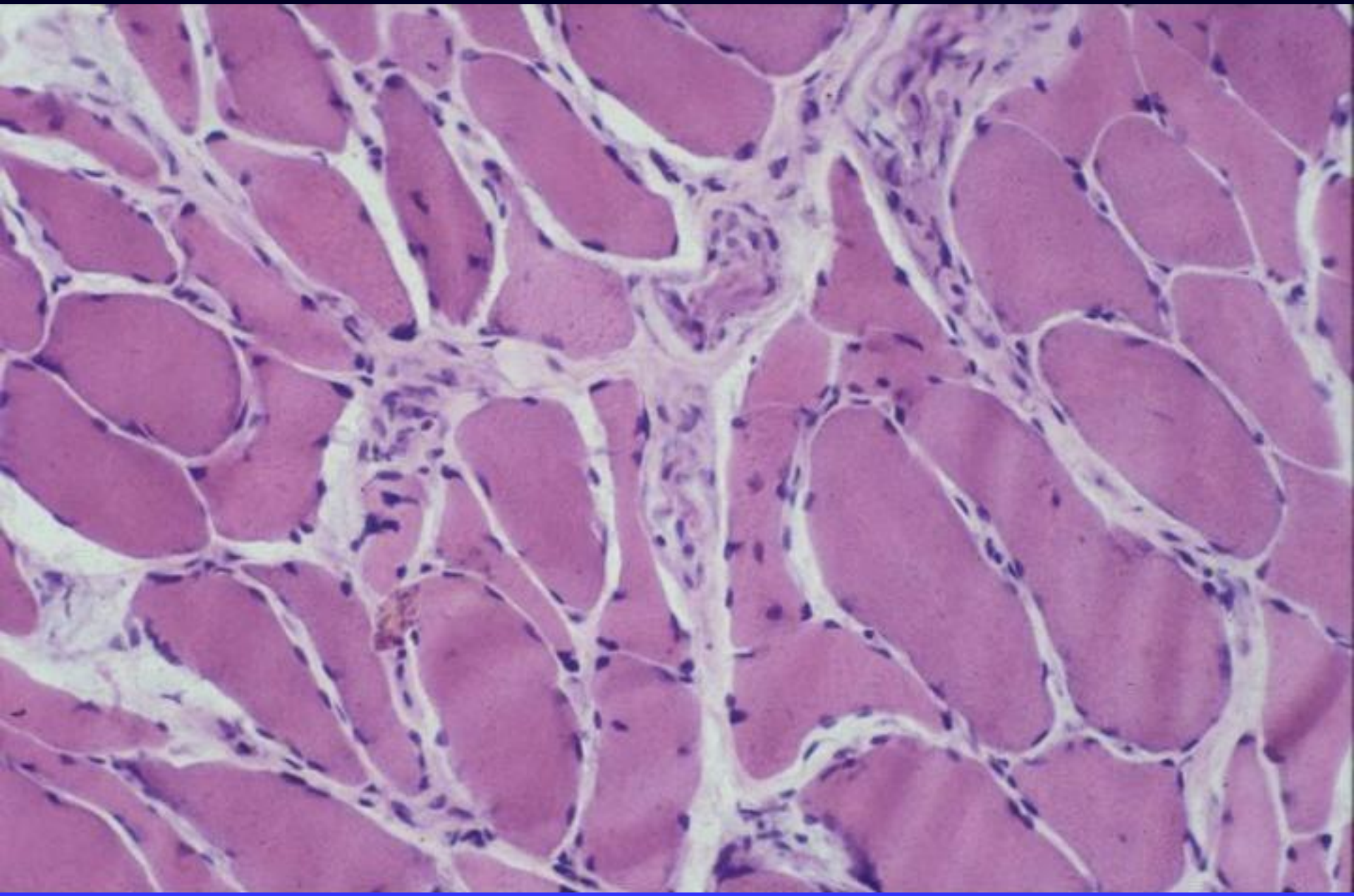


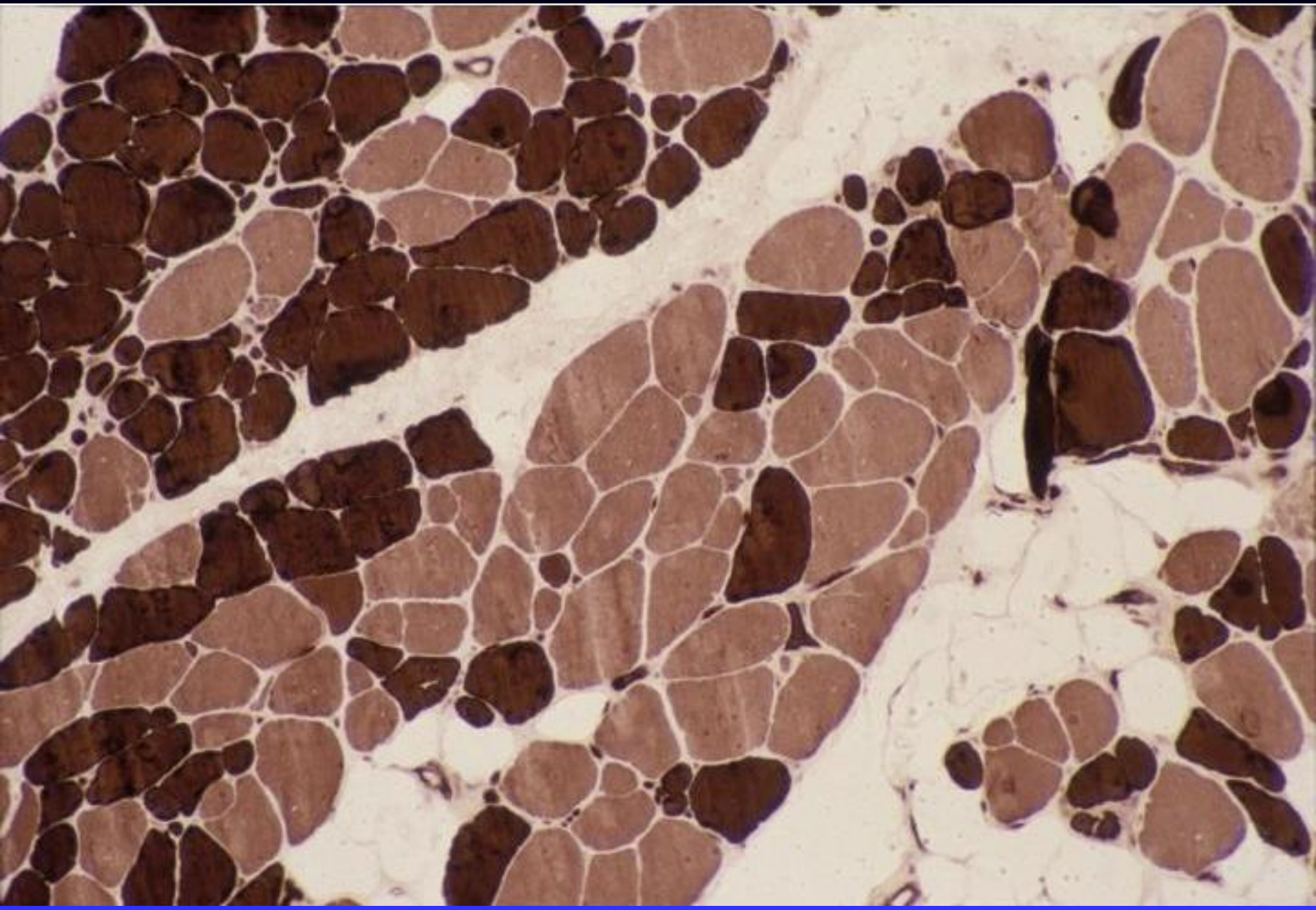
Inclusion Body Myositis – Clinical

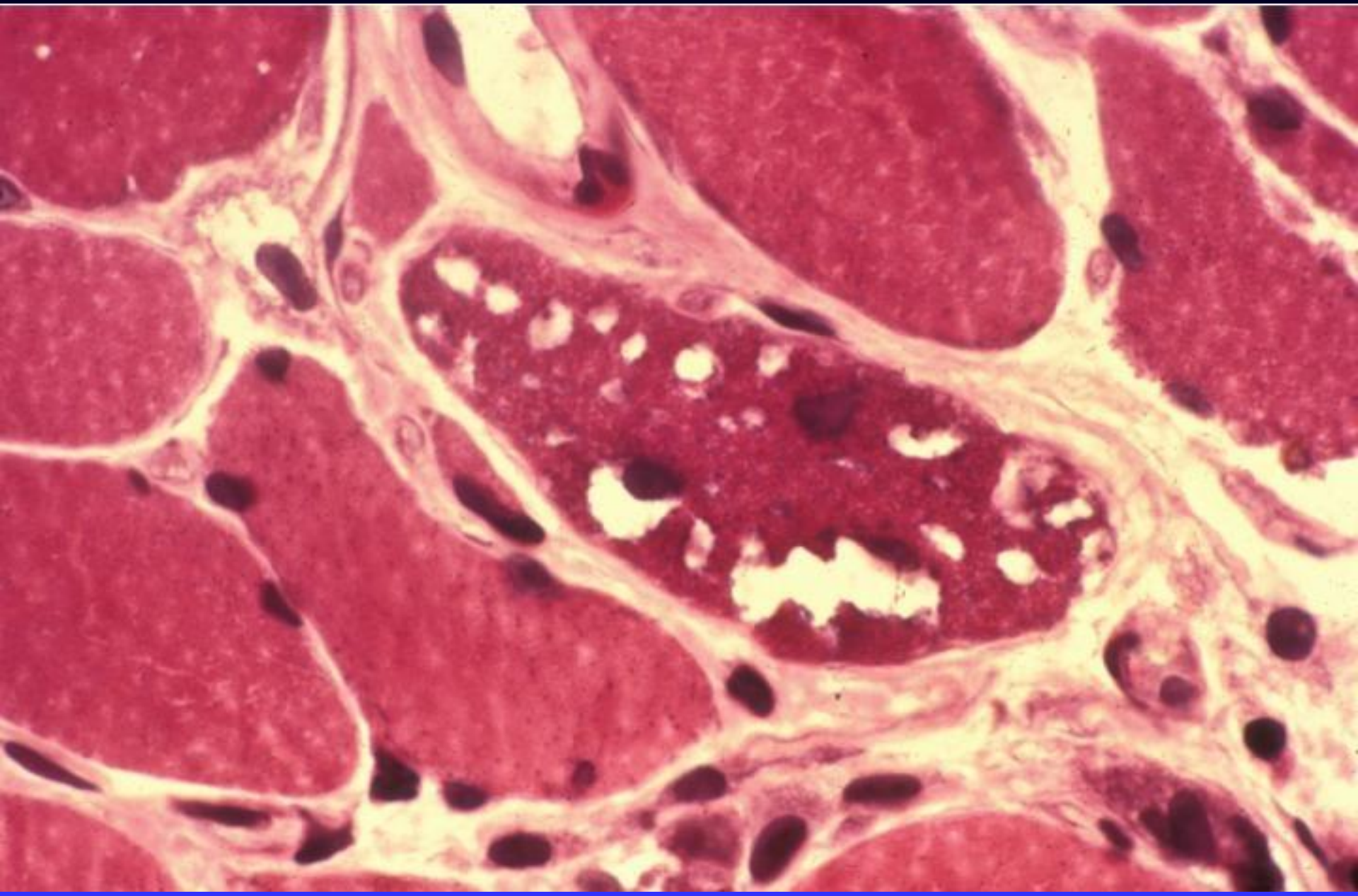
- Weakness
  - Proximal and symmetric
  - Distal
  - Asymmetric
- Response to Therapy
  - Poor if any

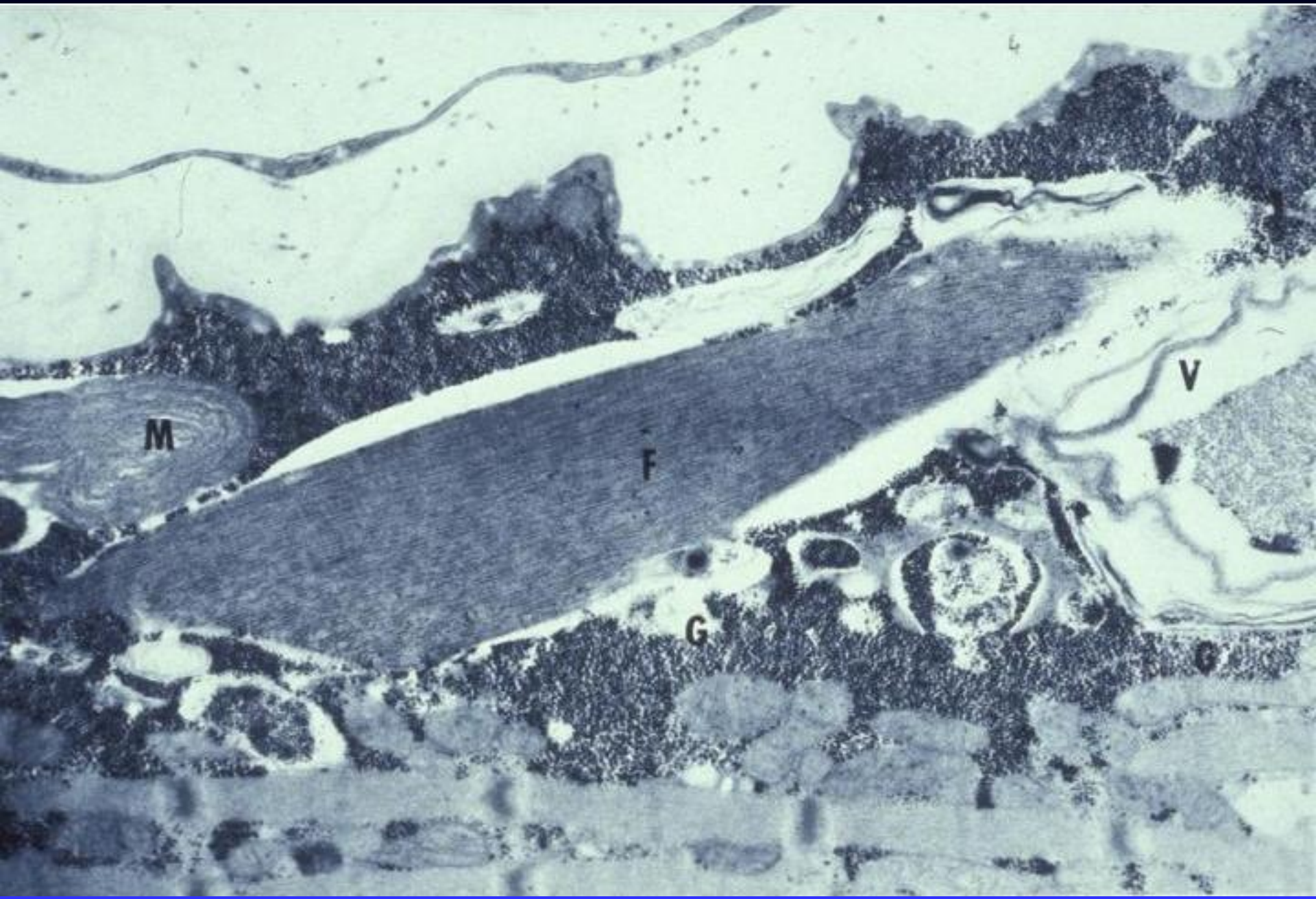
Inclusion Body Myositis

- Cellular infiltrate-like polymyositis but disappears
- Lined vacuoles
- Inclusions
- Amyloid deposits
- Mitochondrial abnormalities








M
F
G
V

Myositis and Connective Tissue Diseases

- Systemic lupus erythematosus
- Scleroderma
- Mixed connective tissue disease

Myositis and Cancer

- Increase risk with dermatomyositis
- Cancers are those most common for age and gender except for ovarian cancer
- Risk is greatest within one year of diagnosis
- Treatment of cancer often treats the myositis

Prognosis

- PM and DM
  - 55% do great
  - 35% have variable results
  - 10% do poorly
- IBM
  - Does not respond to drug therapy
  - Typically progresses slowly

Myositis Specific Autoantibodies

- May help predict outcomes

Anti-Synthetase Syndrome

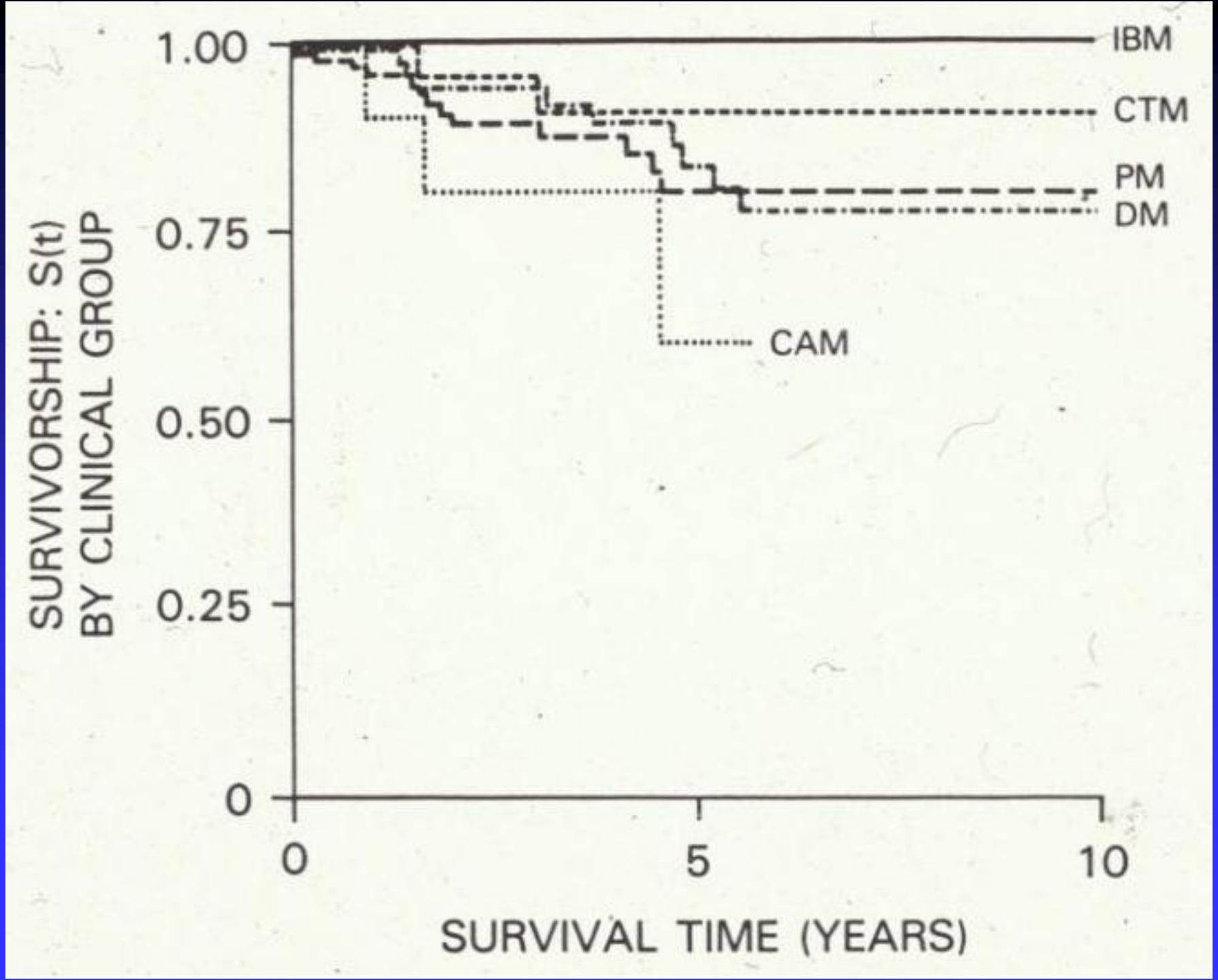
- Polymyositis > dermatomyositis
- Interstitial lung disease
- Fever
- Arthritis
- Raynaud's
- Mechanic's hands
- Difficult to treat

Anti-SRP

- Polymyositis >>> dermatomyositis
- Cardiomyopathy
- Distal weakness
- Very poor prognosis*

Anti-Mi 2

- Dermatomyositis
- Excellent prognosis*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SURVIVORSHIP: S(t)
BY CLINICAL GROUP
IBM
CTM
PM
DM
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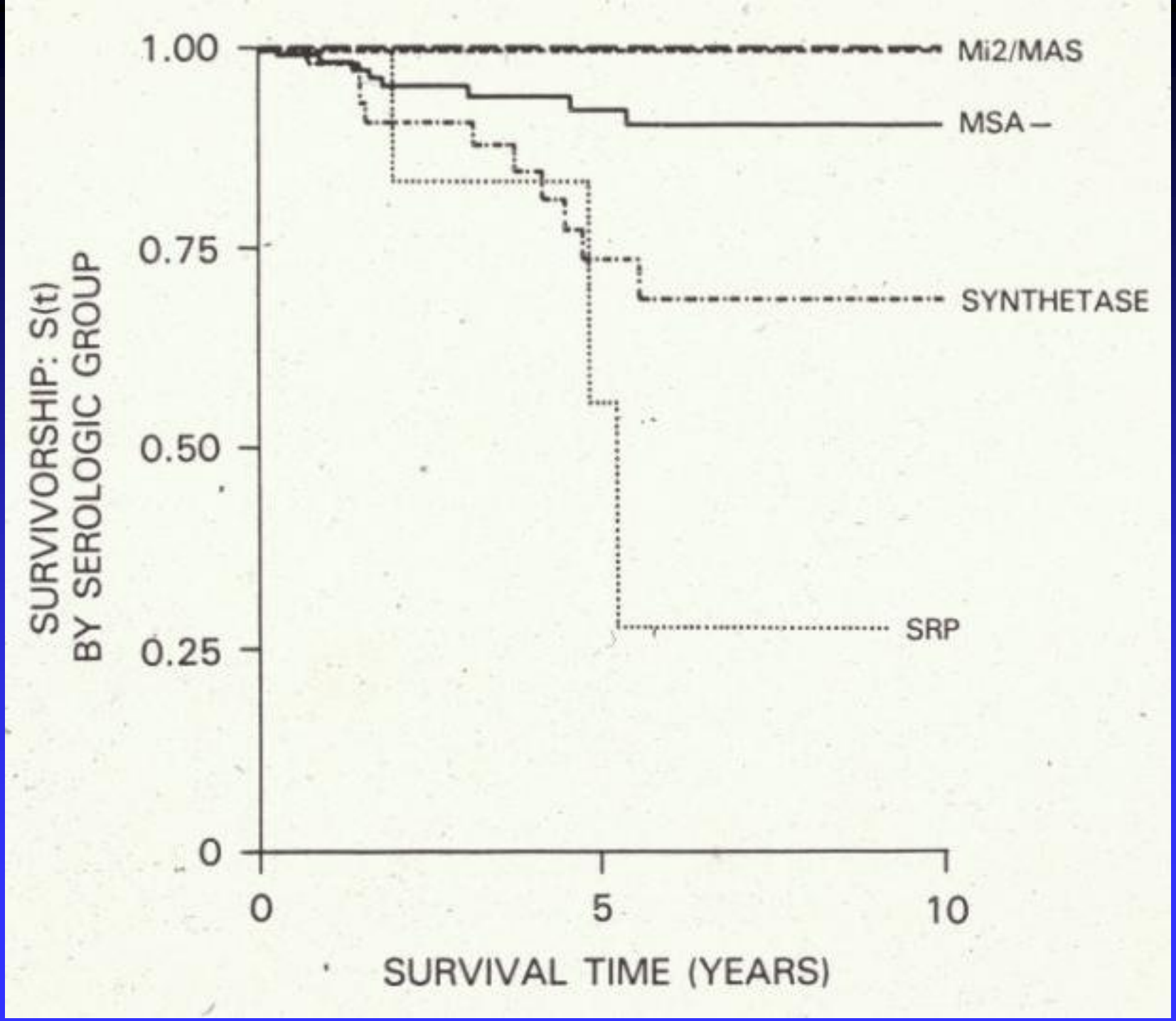
SURVIVAL TIME (YEARS)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SURVIVORSHIP: S(t)
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Mi2/MAS
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SYNTHETASE
SRP
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10
SURVIVAL TIME (YEARS)

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Management of Inflammatory Myopathy

Impact of Cortisone on Polymyositis

- Changed the mortality form over 50% to less than 10%
- Steroid therapy may prove curative to 50%

Controlled Trials

- Azathioprine + Prednisone
  - Bunch, 1981, 20 patients
- Plasma and leukophoresis
  - Miller, 1992, 39 (26) patients
- IV immune globulin
  - Dalakas, 1993, 15 patients
- Methotrexate/azathioprine – IV methotrexate
  - Villalba, 1997, 30 patients

Others Used

- Cyclosporine
- Cyclophosphamide
- Chlorambucil
- Etanercept
- Infliximab
- Intravenous immune globulin
- Mycophenolate
- Plasmapheresis
- Rituximab
- Tacrolimus

Lack of Response

- Treatment insufficiency
  - (not enough drug prescribed or taken)
- Refractory disease
  - (IBM, interstitial lung disease, cancer, anti-SRP)
- Steroid toxicity
- Incorrect diagnosis